Welcome

To

Presentation of

Preparation of Development Plan for Fourteen Upazilas

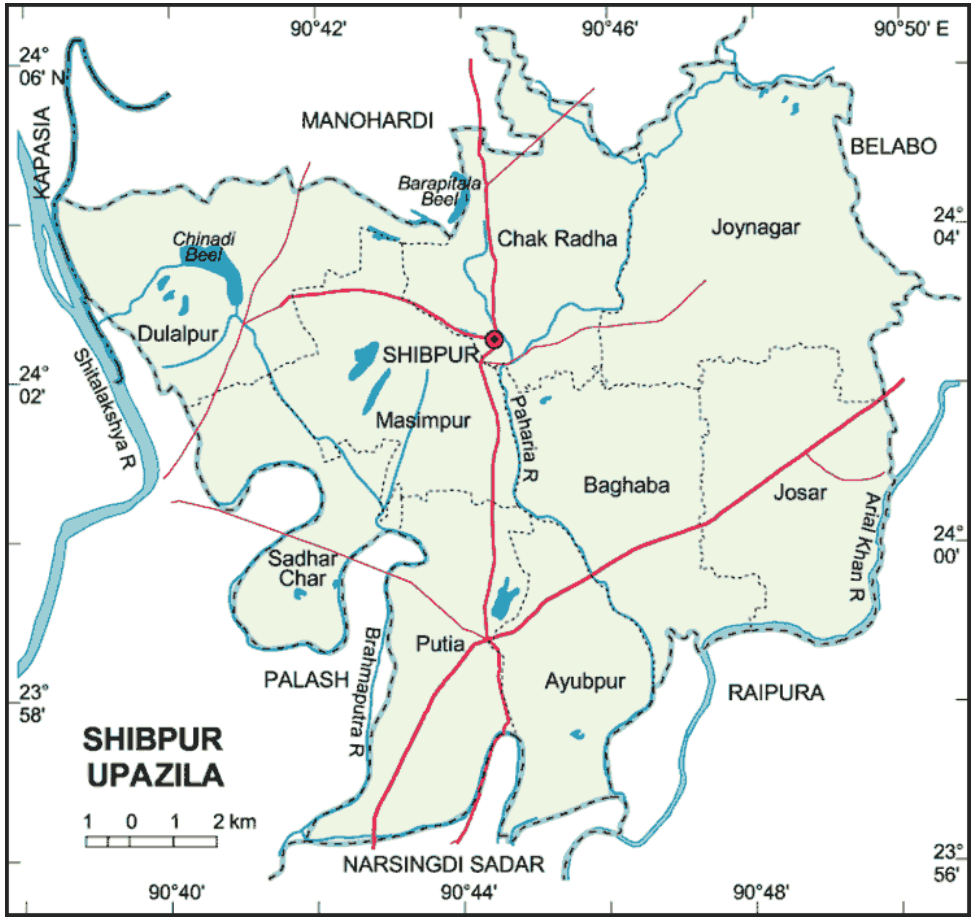
Package 02:

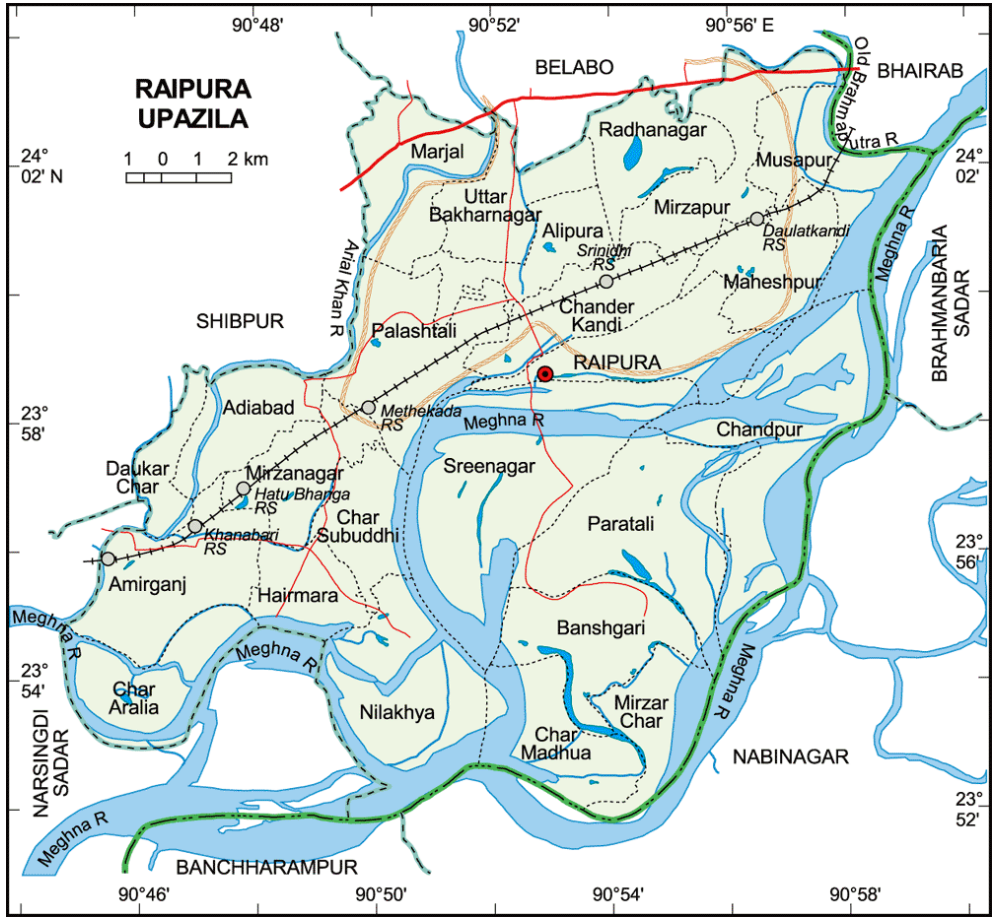
Raipura Upazila, District: Narshingdi
Shibpur Upazila, District: Narshingdi
Ishwarganj Upazila, District: Mymensing

Draft Survey Report

Hydrological Survey Report
of Raipura, Shibpur & Ishwarganj Upazila

Upazila Maps

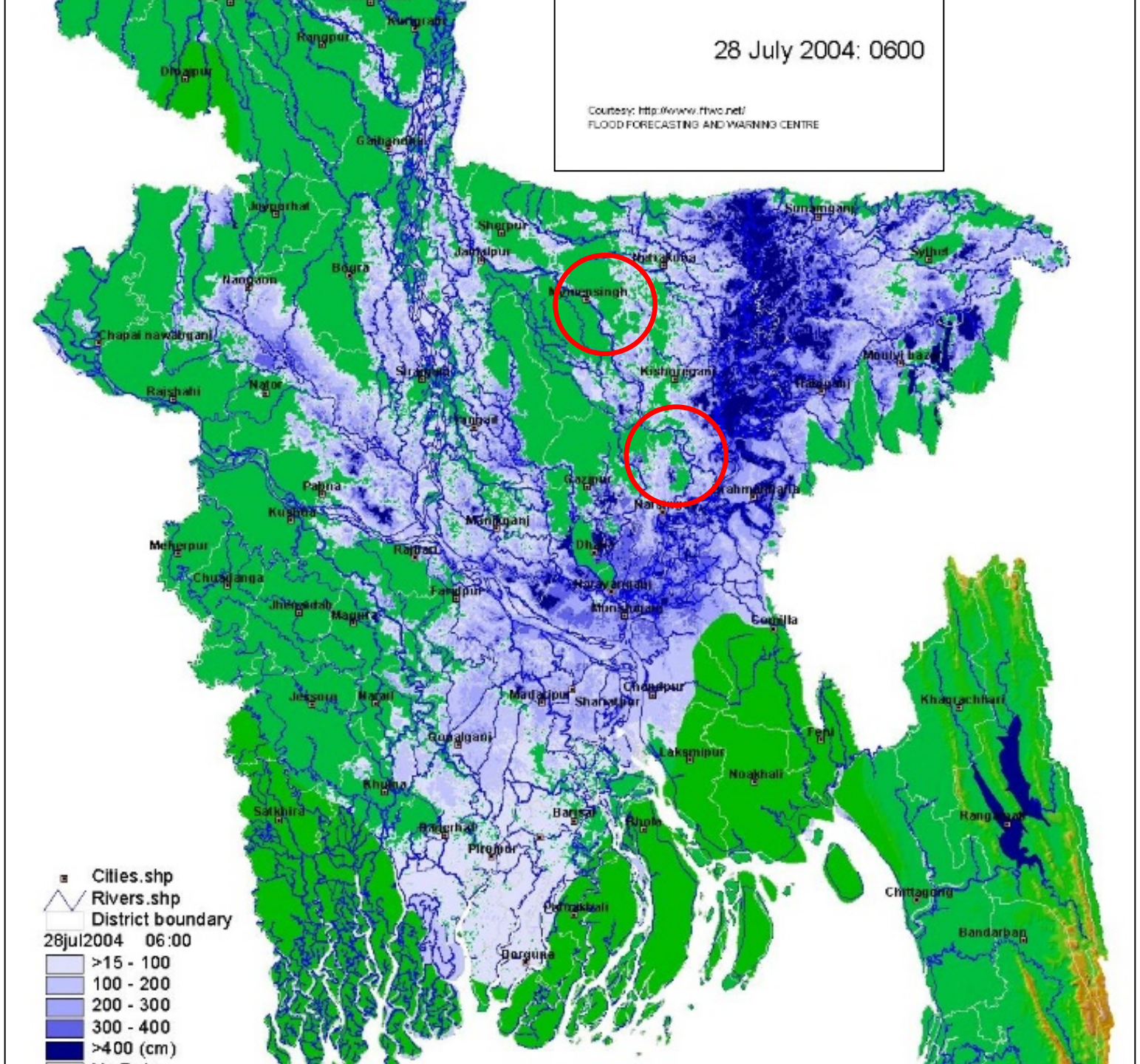




Upazila Maps

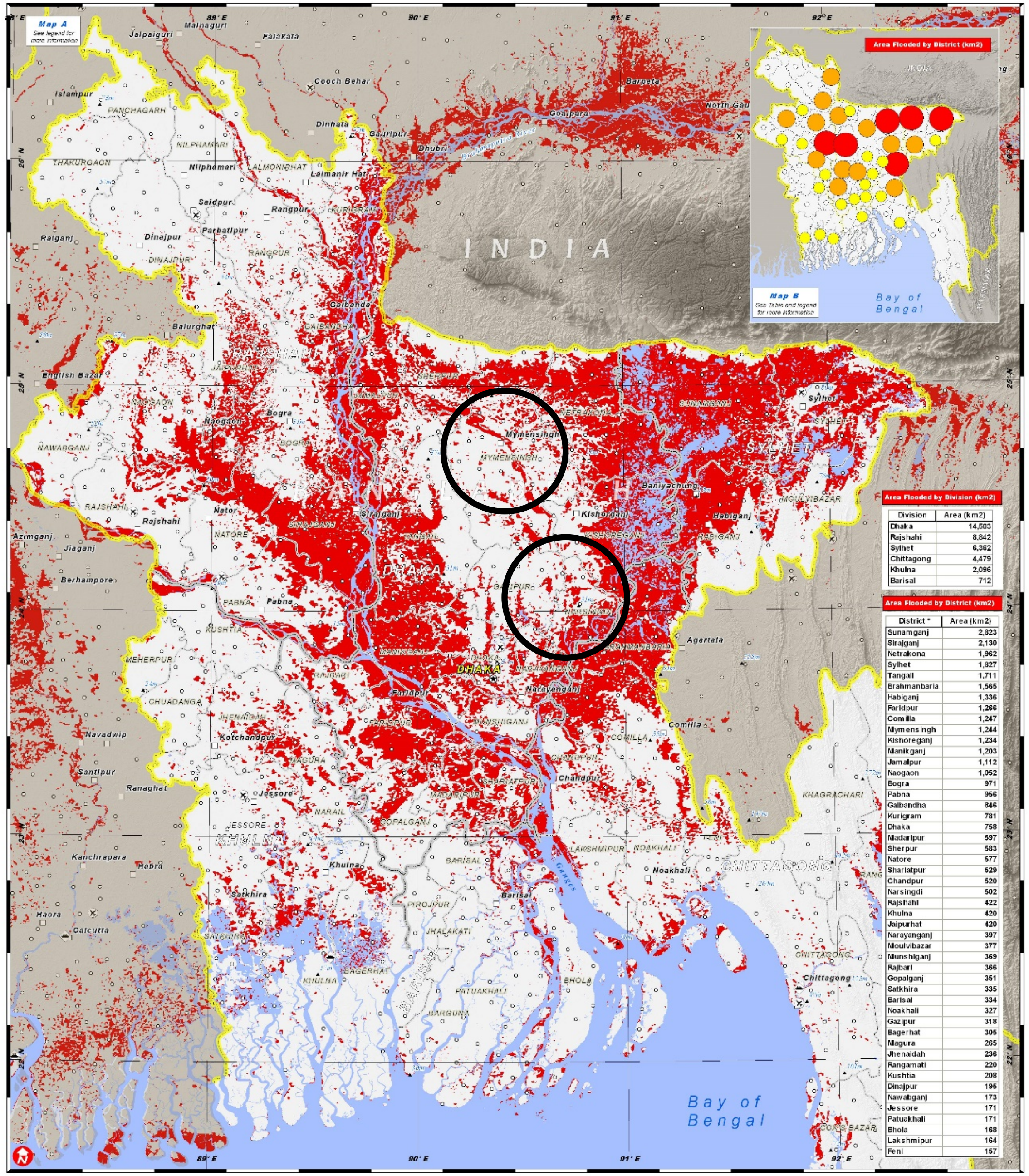
Bangladesh 2004 Flood map

Courtecy: Flood Forecasting and Warning Centre



Flood Detection with MODIS Terra & Aqua Imagery Recorded from 2-5 August 2007

Glide No: FL-2007-000080-BGD



Area Flooded by Division (km2)

Division	Area (km2)
Dhaka	14,503
Rajshahi	8,842
Sylhet	6,362
Chittagong	4,479
Khulna	2,096
Barisal	712

Area Flooded by District (km2)

District *	Area (km2)
Sunamganj	2,823
Sirajganj	2,130
Netrakona	1,962
Sylhet	1,827
Tangail	1,711
Brahmanbaria	1,565
Habiganj	1,336
Faridpur	1,266
Comilla	1,247
Mymensingh	1,244
Kishoreganj	1,234
Manikganj	1,203
Jamalpur	1,112
Naogaon	1,052
Bogra	971
Pabna	956
Gaibandha	846
Kurigram	781
Dhaka	758
Madaripur	597
Sherpur	583
Natore	577
Shariatpur	529
Chandpur	520
Narsingdi	502
Rajshahi	422
Khulna	420
Jaipurhat	420
Narayanganj	397
Moulvibazar	377
Munshiganj	369
Rajbari	366
Gopalganj	351
Satkhira	335
Barisal	334
Noakhali	327
Gazipur	318
Bagerhat	305
Magura	265
Jhenaidah	236
Rangamati	220
Kushtia	208
Dinajpur	195
Nawabganj	173
Jessore	171
Patuakhali	171
Bhola	168
Lakshmipur	164
Feni	157

Map Scale for A2: 1:1,260,000

1 Centimeter = 12.60 Kilometers

0 10 20 40 60 80 100 120 140 160 180 200 Kilometers

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Map Information

This map illustrates satellite detected flood water over the affected areas of Bangladesh. Those areas likely covered with flood water as of 2-5 August 2007 are shown in red

Symbol Legend

Capital

Flood Water (2-5 Aug 2007)

Pre-Flood Water

Estimated Area of Flood Water by District (km2)

1 - 250

PLACE NAMES

INDIA ..... Country

Satellite Data .... MODIS Terra & Aqua (NASA)
Image Resolution .... 250m - 500m
Image Dates .... 1-10 May 2007, 2-5 August 2007
GIS Data .... USGS, NGA, UNJLC, OCHA, WFP
Population Data ..... LandScan 2004

OBJECTIVES OF THE SURVEY WORKS

- Collecting water level data of BWDB stations SW177, SW228.5, SW229, SW274, SW295 & SW 311 and rainfall data of BWDB stations CL64,CL65,CL71, CL76 & CL79.
- Collecting rainfall data of BMD stations.
- Collection of bathymetric data of the major rivers at Raipura, Shibpur and Ishwarganj.
- Identification of hydraulic structures and collection of information about sill levels, openings etc.
- Identification of flood hazard locations.
- Identification of flow direction and tidal effects.
- Collection of observed flood levels in the field.
- Collecting information of any existing drainage system within the town area
- Identification of water logging zones.
- Collecting information regarding encroachments of natural water bodies and drains.

WORKS PENDING

- Bathymetric survey of the major rivers of Raipura, Shibpur and Ishwarganj are pending as monsoon water is still to subside, making bathymetric survey in conventional method impossible.
- Collection of BMD station data.

Paglai River at Raipura

Brahmaputra River near Patia Bazar at Shibpur

WORKS DONE

During Physical Feature survey:

- Hydraulic structures were identified and information regarding the structures were collected.
- Flood prone zones were identified.
- Flow directions of the rivers and khals were observed.
- Information regarding any existing drainage system within the town area were collected.
- Frequent water logging zones were identified.
- Information regarding encroachment of natural water bodies were collected.
- Water level and rainfall data were collected from BWDB

Pier of a Bridge over Kalagachia Channel at Shibpur

Road bridge over Arial Khan river near BWDB station SW 274 at Narshingdi

Identification of culverts on the Upazila highway

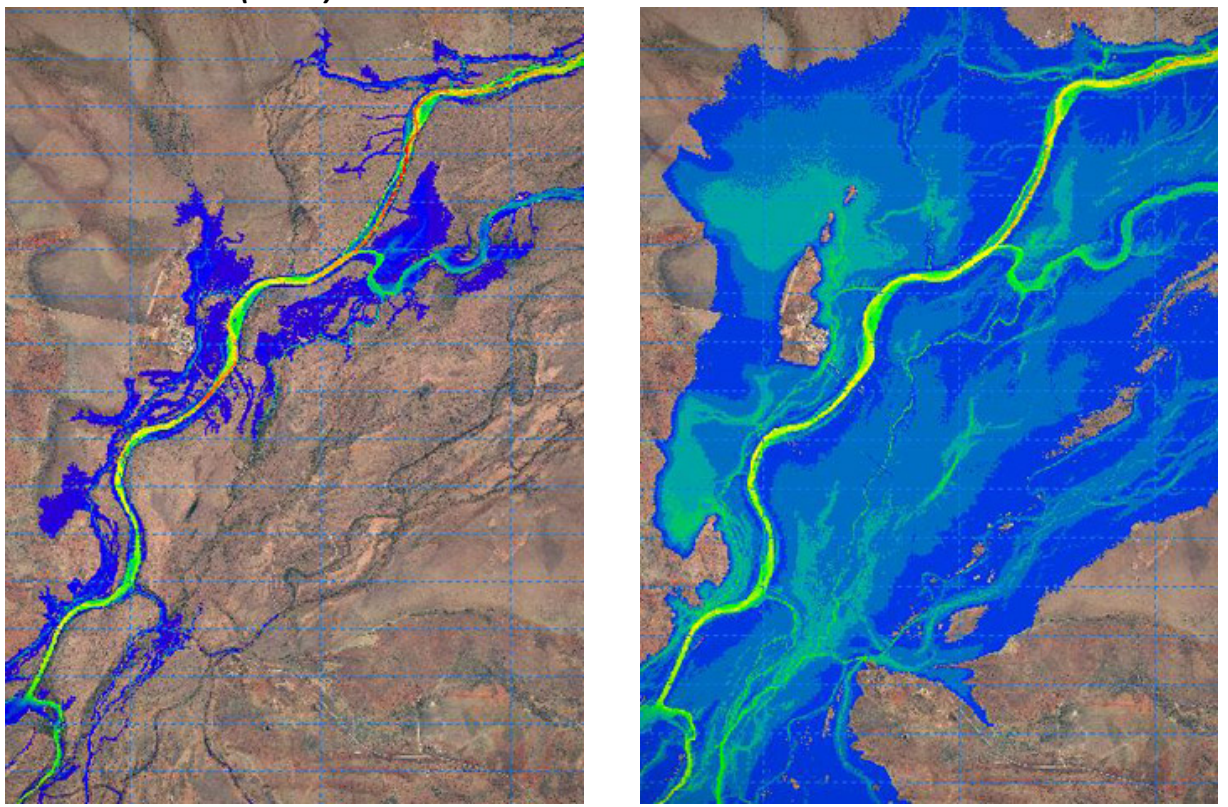
RATIONALES

- Frequency analysis is done for collected water level, discharge and rainfall data using extreme value distribution, normal distribution, log normal distribution and log-pearson type III distribution to project these data for different return periods.
- χ^2 test and Kolmogorov-shmirnov test is done to check the goodness of fit of the distribution.
- Bathymetric data will be incorporated to the DEM.
- Contour of the terrain will be generated from the DEM.
- Catchments and the sub-catchments will be identified using ArcGIS.
- Drainage inventory for the existing drainage system is prepared.

RATIONALES

- To run flood models in the flood plains, the water level data and discharge data will be needed.
- It will also require the bathymetric data of the major rivers in the area.
- This analysis will be used to asses the effect of flash floods, frequent in the area.

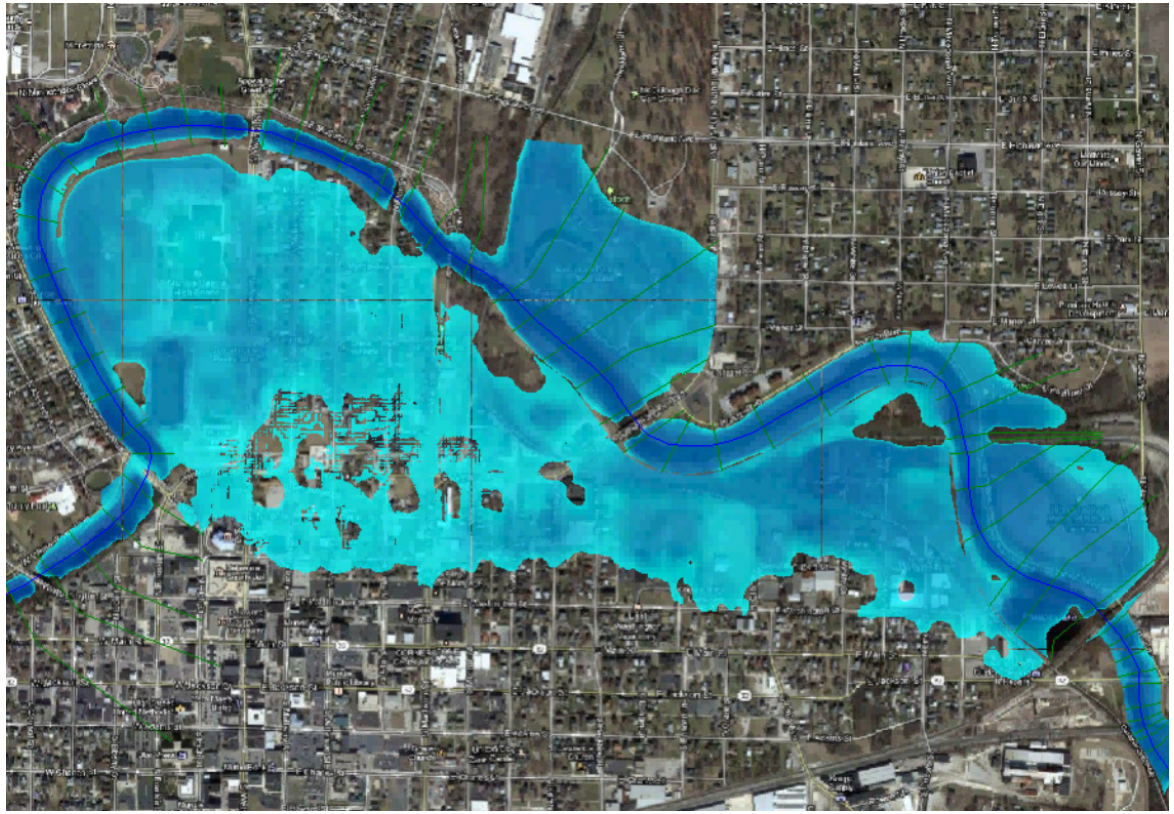
- *An integrated 1D-2D flood model on a flood plain showing flood conditions at different water level and flow time using MikeFlood (DHI)*



RATIONALES

- The model analysis will also help us identify the areas in the town most susceptible to water logging problems.

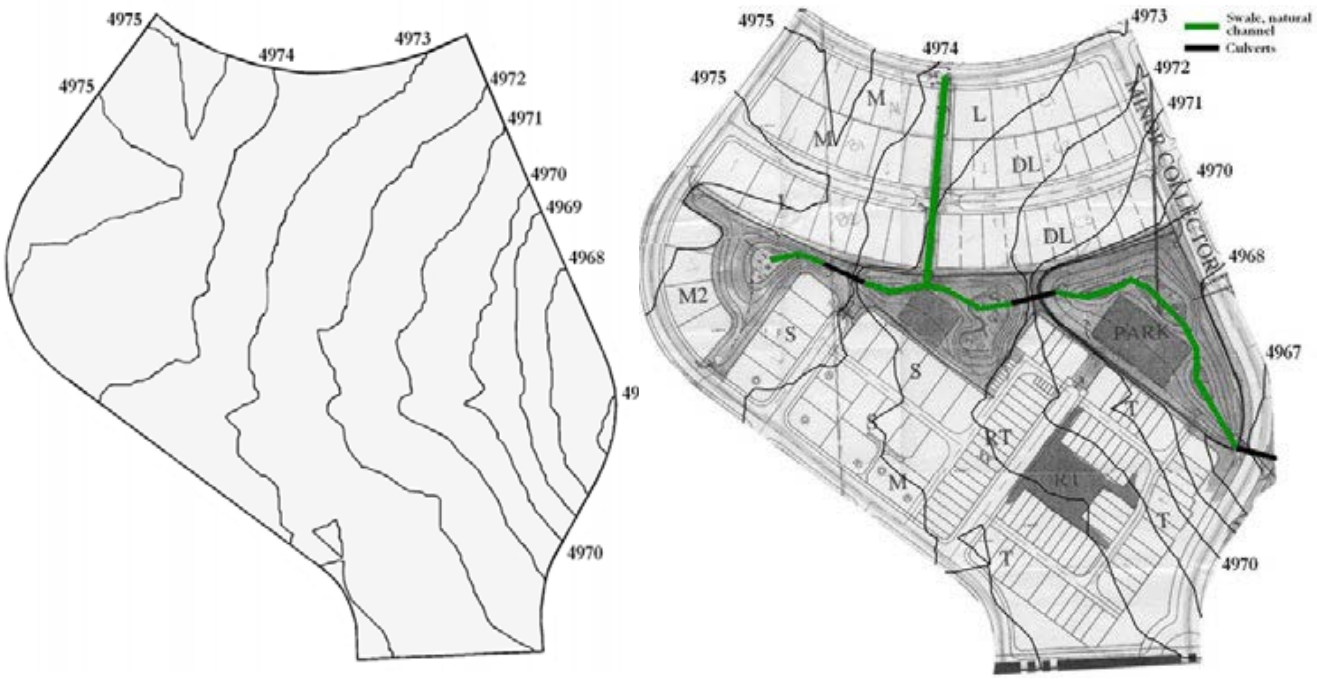
- *An integrated 1D-2D flood model showing flood conditions in a city area using HEC-RAS*



RATIONALES

- Existing & Proposed Drainage system will be assessed using models that will require identification of catchments and sub-catchments
- Rainfall data will be used to calculate runoffs.
- This analysis will be used to asses the efficiency of the existing and proposed drainage systems.

- *Model developed using EPA SWMM simulating undeveloped (left) and developed (right) conditions to calculate and compare the difference of discharge*



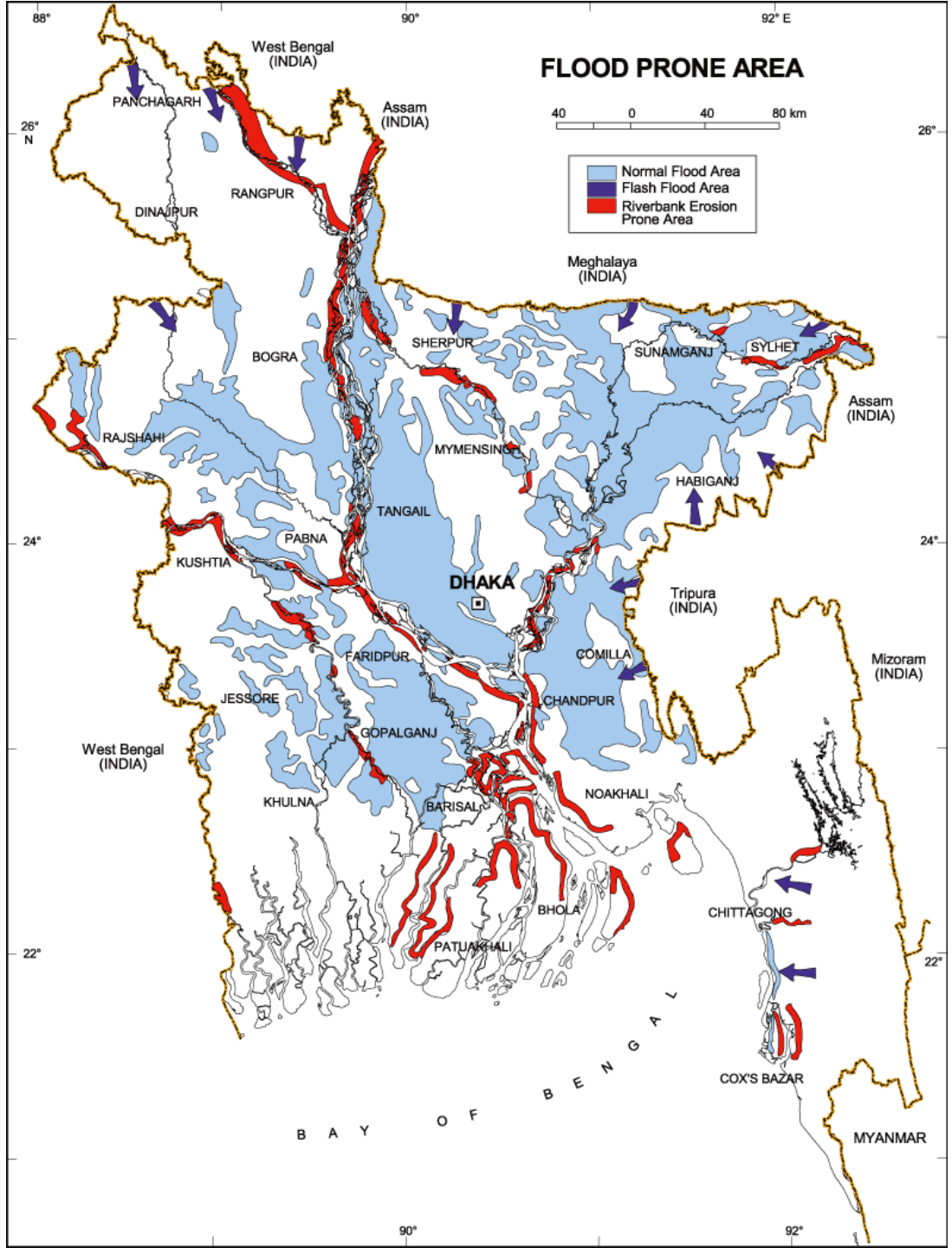
ASSESMENT OF SEA LEVEL RISE IN BANGLADESH

- STUDIES:
  - **Milliman, J.D., Broadus, J.M. and Frank G. (1989). Environmental and Economic Impact of Rising Sea Level and Subsiding Deltas: The Nile and Bengal Examples. In Bangladesh Quest. Vol.: 1, pp 11-12.** - reported 1.0 cm per year sea level rise in Bangladesh.
  - **UNEP, 1989** - showed 1.5 m sea level rise in Bangladesh coast by 2030, affecting 22,000 Sq. km (16% of total land mass) area with a population of 17 million (15% of total population).
  - **World Bank, 2000. Bangladesh: Climate Change & Sustainable Development. Report No. 21104 BD, Dhaka** - Showed 10 cm, 25cm and 1 meter rise in sea level by 2020, 2050 and 2100.

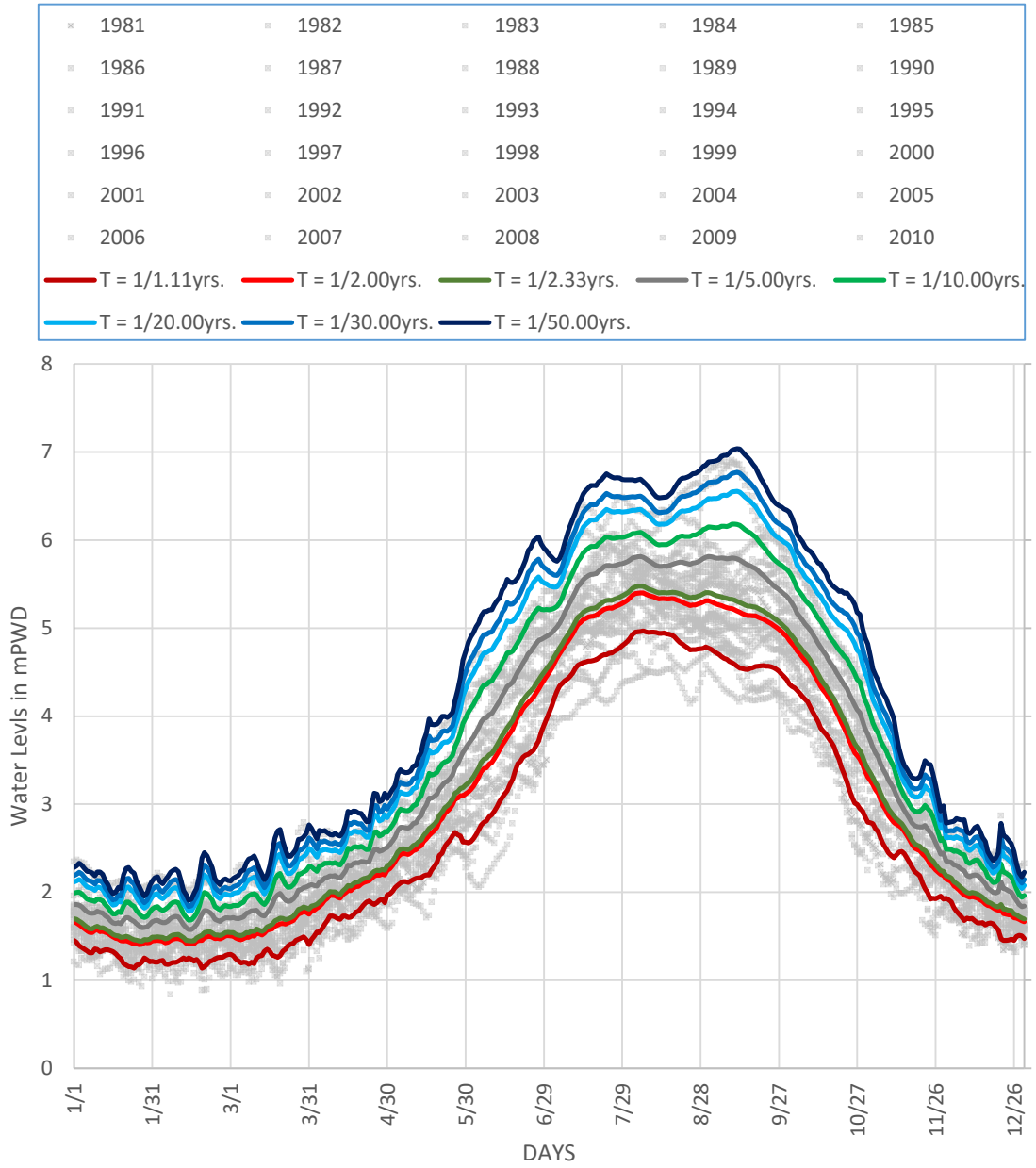
RIVER BANK EROSION

MAP SHOWING THE RIVER BANK EROSION PRONE AREAS IN BANGLADESH (BWDB)

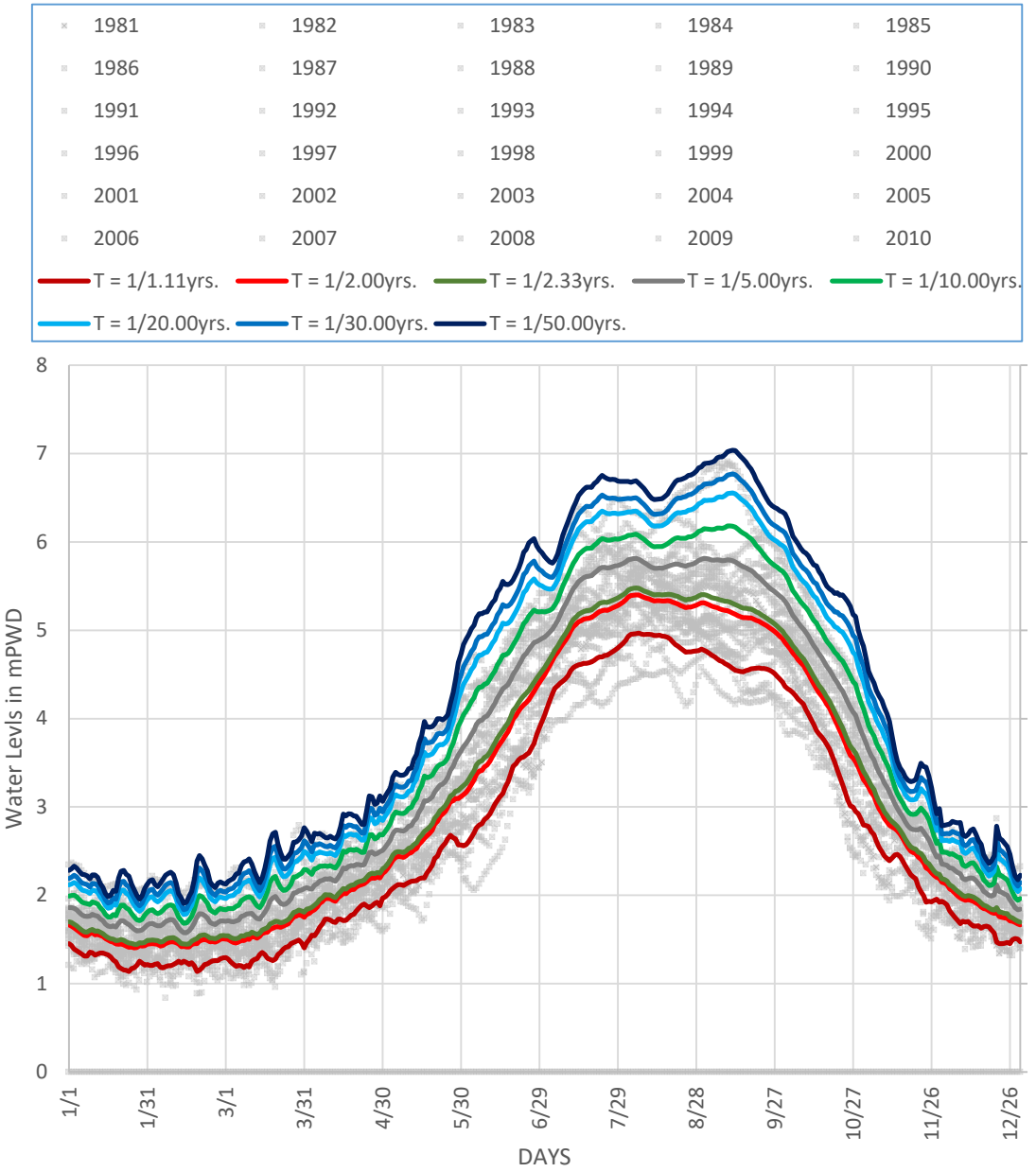
- Raipura experiences river bank erosion at the banks with the mighty Meghna River.
- Ishwarganj and Shibpur do not experience any significant river bank erosion.



DAILY BASIS HIGH TIDE LEVEL ANALYSIS OF BWDB WATER LEVEL STATION SW274 AT NARSHINGDI SADAR, NARSHINGDI (EV I - DISTRIBUTION)



DAILY BASIS LOW TIDE LEVEL ANALYSIS OF BWDB WATER LEVEL STATION SW274 AT NARSHINGDI SADAR, NARSHINGDI (EV I - DISTRIBUTION)




1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS